CLE AIChE
The Global Home of Chemical Engineers

American Institute of Chemical Engineers, Cleveland Section

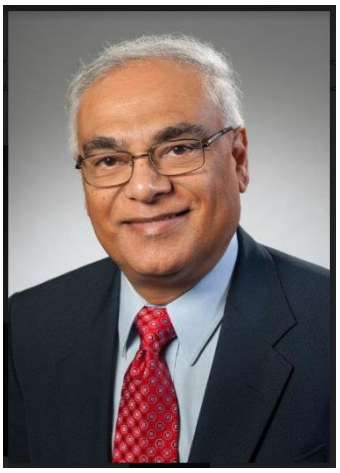
Visit our Web Page at:
https://www.aiche.org/community/sites/local-sections/cleveland/newsletters

Join our LinkedIn Group called:

AIChE Cleveland Section and let colleagues know it is available

RISK & PROCESS SAFETY CONSULTING

RPSC, LLC



Monday, January 29, 2024, 6:00 PM

AIChE Membership is Not Required to attend any meetings

"Chemical Process Safety Analysis"

The Independence Library of the Cuyahoga County Public Library; Meeting Room
6361 Selig Drive, Independence, OH 44131; 216-447-0160

Gurmukh Bhatia, CPSA, Certified Process Safety Auditor, Risk & Process Safety Consulting (RPSC, LLC), CLE AIChE Risk & Process Safety Director. Email address: gbhatia.rpsc@gmail.com

Abstract: Chemical Process Safety as a field and as a discipline has gained wide acceptance as a vital and significant part of an overall Environmental, Health and Safety (EHS) Management System for chemical operations. After a brief look at some recent process safety incidents, we will examine the history and the origins of chemical process safety and its components as valuable and necessary tools in preventing process safety incidents. We will also lay the groundwork for a more detailed study of the individual components in the coming weeks.

Biography: Mr. Gurmukh Bhatia is President of RPSC, LLC a Risk & Process Safety Consulting services company. He retired as the Corporate Director for Process Safety and Chemical Security from The Sherwin-Williams Company, with over 45 years of work experience in the chemical industry. Mr. Bhatia is certified by the Board of Environmental, Health, and Safety (EHS) Auditor Certification (BEAC) as a Certified Process Safety Auditor (CPSA) with 15 years of auditing experience at Process Safety Management (PSM) regulated facilities. He graduated from the Case Institute of Technology with a Bachelor's Degree in Chemical Engineering.

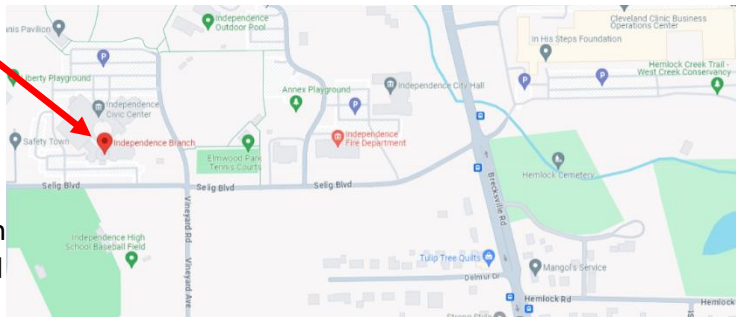
For those attending this event, a Professional Development Hour Certificate (1 PDH) will be sent to you in the following days by Joe Yurko.

Meeting Location:
6361 Selig Drive
Independence, OH 44131
216-447-0160

The CCPL Independence Library *(see map below)*
6:00 – 6:30 pm: Social Gathering, Meet & Greet
6:30 – 7:30 pm: Dinner
7:30 – 8:30 pm: Presentation with Q & A

Dinner: Professionals: $10
Students: $5 each
Email RSVP & Vote your meal preference for only 1 of 3 meals.

Menu Vote Selection:
Meal with most votes will be served:
1. Irish Corn Beef, Cabbage, Potatoes
2. Texas Pulled Pork/Chic, Baked Bean
3. Italian Meatballs, Pasta, Bean Salad



RSVP & Meal Vote Required by Monday 22Jan2024 with Joseph Yurko and AIChE at: yurkojoe5@gmail.com

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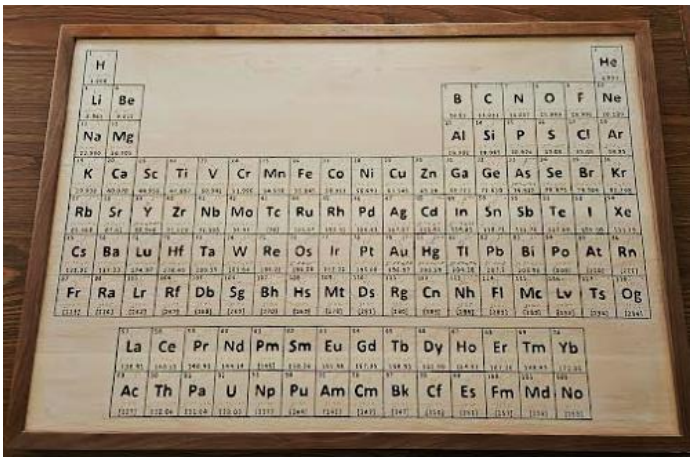
Featured Display of Braille Periodic Table of the Elements (by Dr. Micharl Fricke) during our Meet & Greet period of the meeting.



Michael Fricke, PhD from the American Chemical Society (ACS) Cleveland Section, will be visiting our CLE AIChE Meeting on Thursday, February 15th at the Sanctuary Restaurant to display his handy woodworking skills. He has created another Braille Periodic Table of the Elements made of Maple with a Walnut frame. We are welcoming Mike to share his work with our section and hope that our CLE AIChE logo can be added to his project's history!

Mr. Fricke is an ACS Councilor, Ph.D. Drug Development Chemist and Elemental Impurity Specialist with Olon Ricerca Bioscience. Previous pharmaceutical experience includes Hikma, Nektar Therapeutics, Boehringer Ingelheim, Merck and Schering Plough. His graduate and post-doctoral research was devoted to the study of arsenic. This work included the discovery and first successful synthesis and isolation of dimethylthioarsinic acid (DMTA) which has been identified as the most cytotoxic metabolite of arsenic in humans.

Previously, Mike was with Hikma performing USP <232>/<233> site preparation, early-stage new product development and API selection, analytical development, stability sample management, compendial method verification and plasma techniques. Prior to his work with Hikma, Mr. Fricke was with Borhringer Ingelheim in Bedford, OH performing Product and Process Development duties as an analytical team leader for ANDA regulatory submissions from conception through transfer to quality control. He was a Key User and Coordinator for Waters Empower Chromatography Data Software. He also performed method development/remediation and validation/verification duties as well as ANDA stability management/testing analytical support for formulation development incorporating QbD principles and site expert for trace metal testing. Responsible for elemental impurity laboratory creation/design, instrument selection and quality control implementation programs.

Mike was also responsible for the installation and operation of an Inductively Coupled Plasma Mass Spectrometer (ICP-MS) system at BI-BVL with Joe Yurko. The ICP-MS was used to identify any out of specification raw materials that may contain excess cadmium, lead, inorganic arsenic, or inorganic mercury.

DECEMBER 2023 CLE AICHE MEETING: THE FUTURE OF NUCLEAR ENERGY,

WITH ANDREW OHRABLO, MAINTENANCE SUPERVISOR FROM THE PERRY NUCLEAR POWER PLANT

CLE AIChE Guests and Speaker at the Dinner Party prior to presentation. Joe Spagnuolo with Andrew Ohrablo

CLE AIChE Survey Results from 2023 Meeting Venue Change Considerations

The CLE AIChE meeting venue survey compared meetings at restaurants with ordering dinner from a menu versus meetings at Cuyahoga County Public Libraries (CCPL) with homemade meal menu voting.

The results of our survey had 14 respondents with varying interests.

CLE AIChE members interested in meetings at restaurants and ordering from the menu:	9
CLE AIChE members interested in meetings at CCPL and voting on homemade meals:	5
Total votes:	14

Based on a split decision we will have most of our 2024 meetings at restaurants and will test some meetings at CCPL branch libraries with homemade meals we will vote on during your RSVP for the meeting of that month. There will be a variety of three meals to select from for the meeting and only the most popular meal will be served. The three different meals to vote on will be different for each month. We have 12 different meals. Three meals will be presented & voted on each month. One will be served. The guest speaker will select the three potential meals and you will vote on the one you would like:

1 Tony Paco's Chili	2 Colorado Stew	3 Texas BBQ	4 German Oktoberfest
5 Mexican Burritos	6 Asian Chop Suey	7 Irish Ruben	8 Ukrainian Cabbage Rolls
9 Italian Meatballs & Pasta	10 Louisiana Cajun	11 Hawaiian Stew	12 New England Chowder

Our January CLE AIChE 2024 meeting will be the first pilot testing of this new meeting venue. It will be held at the Independence Branch of the Cuyahoga County Library public meeting room. Please vote on your meal selecting only one of the three meals to be voted on during your meeting RSVP on page # 2. Thank you!

ARTICLE, SEE December 1, 2023 ISSUE

Future Focused, Ethics; HPAC Engineering Magazine,

https://www.hpac.com/home/article/21278409/epa-moves-to-strengthen-lead-and-copper-rule-for-drinking-water

The EPA Moves to Strengthen Lead and Copper Rule for Drinking Water

Proposal would accelerate progress toward achieving goal of removing 100% of lead pipes across U.S.

PRESS RELEASE

WASHINGTON, November 30, 2023 – Today, the U.S. Environmental Protection Agency (EPA) announced a proposal to strengthen its Lead and Copper Rule that would require water systems across the country to replace lead service lines within 10 years. EPA is also proposing additional improvements to protect public health, such as lowering the lead action level and improving sampling protocols utilized by water systems. Today's proposed action significantly advances President Biden's commitment to remove every lead service line in America to protect children and vulnerable populations from the negative impacts of lead in drinking water, particularly those living in disadvantaged communities.

The Biden-Harris Administration is using every tool available to help communities and water systems Get the Lead Out—including investing a historic $15 billion through the Bipartisan Infrastructure Law to replace lead service lines, providing technical assistance to communities, and supporting the development of a national inventory of lead service lines. The Lead and Copper Rule Improvements are central to the whole of government approach detailed in the Administration's Lead Pipe and Paint Action Plan.

"Lead in drinking water is a generational public health issue, and EPA's proposal will accelerate progress towards President Biden's goal of replacing every lead pipe across America once and for all," **said EPA Administrator Michael S. Regan**. "With collaboration and the focused actions proposed today, EPA is delivering on our charge to protect all Americans, especially communities of color, that are disproportionately harmed by lead in drinking water systems."

"EPA's proposed Lead and Copper rule is grounded in the best available science and successful practices utilized by drinking water systems to protect children and adults from lead in drinking water," **said EPA Assistant Administrator for Water Radhika Fox**. "Cities like Newark, NJ, Benton Harbor, MI, and Green Bay, WI have all successfully gotten the lead out of their water systems. Our proposed rule applies the lessons learned to scale these successes to every corner of the country,"

The science is clear: there is no safe level of lead exposure. In children, it can severely harm mental and physical development—slowing down learning and damaging the brain. In adults, lead can cause increased blood pressure, heart disease, decreased kidney function, and cancer.

The proposed Lead and Copper Rule Improvements are a major advancement in protecting children and adults from these significant, and irreversible, health effects from lead in drinking water. Key provisions in the proposal include:

- Achieving 100% Lead Pipe Replacement within 10 years.
- Locating legacy lead pipes.
- Improving tap sampling.

- Lowering the Lead Action Level.
- Strengthening protections to reduce exposure.

The proposal would also require water systems to communicate more frequently and proactively with consumers about lead service lines and the system's plans for replacing the lines.

"President Biden and Vice President Harris believe that everyone should be able to turn on the tap and know that the glass of water they pour is safe to drink," **said White House Council on Environmental Quality Chair Brenda Mallory**. "Today's announcement from EPA represents a major advancement in protecting children and families from lead and builds on our actions across the government to help achieve President Biden and Vice President Harris's vision of removing all lead pipes across the country."

"President Biden and Vice President Harris believe that no family, no child, no American should have to worry about lead exposure – from the water they drink or air they breathe," **said Assistant to the President and White House National Climate Advisor Ali Zaidi.** "That's why the President and Vice President have made replacing every lead pipe in America a centerpiece of their agenda, mobilizing tens of billions of dollars of investment and putting the full throw-weight of the federal government behind this push. EPA's latest action bolsters this historic effort and implements a key element of the Biden-Harris Lead Pipe and Paint Action Plan – more than 10 agencies stepping forward with dozens of bold actions to take on and tackle this public health crisis and this staggering source of environmental injustice."

"Here in Newark, New Jersey, our community persevered through a lead crisis and I'm proud of the work we did removing all 23,000 lead pipes in the city in under three years," **said Kareem Adeem, Director of the Newark Department of Water and Sewer Utilities.** "EPA's new proposed rule will prompt more communities across the country to reduce exposure to lead in drinking water. This action is commendable and represents a positive step forward toward safeguarding the health and well-being of current and future generations."

"A game changer for kids and communities, EPA's proposed new lead and copper rule would help ensure that we will never again see the preventable tragedy of a city, or a child, poisoned by their pipes," **said Mona Hanna-Attisha, Flint, Michigan pediatrician and Associate Dean for Public Health at Michigan State University College of Human Medicine**. I am thrilled that this rule centers our children and their potential - and listens to parents and pediatricians who have been advocating for this for decades."

Once the proposed rule is published in the Federal Register, EPA will accept comments for 60 days. The agency will also hold a virtual public hearing on January 16, 2024, at which time the public will be invited to provide EPA with verbal comments. For more information about the proposed rule, including a pre-publication version of the proposal, fact sheets, and directions for submitting comment and registering for the public hearing, visit the proposed rule webpage.

Background

EPA is taking a comprehensive approach to getting the lead out, including:

- **Regulatory Framework.** EPA's proposed Lead and Copper Rule Improvements follow the science and EPA's authority under the Safe Drinking Water Act to strengthen regulatory requirements to address lead in drinking water.

- **Funding.** The Bipartisan Infrastructure Law provides $50 billion to support upgrades to the nation's drinking water and wastewater infrastructure. This includes $15 billion dedicated to lead service line replacement and $11.7 billion of general Drinking Water State Revolving Funds that can also be used for lead service line replacement. To date, EPA has awarded over $3.5 billion in funding for lead service line replacement across the country.

- **Technical Assistance.** EPA's water technical assistance (WaterTA), including the recently launched Get the Lead Out Initiative which will partner with 200 underserved communities nationwide, helps communities identify lead services lines, develop replacement plans, and apply for funding to get the lead out.

- **Practical Implementation Tools.** Through training, tools, webinars, and case studies, EPA provides support to drinking water systems to reduce lead exposure.

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Contact: U.S. EPA Press Office (press@epa.gov)

ARTICLE, SEE November 27, 2023
Chemical & Engineering News (C&EN) Magazine, American Chemical Society (ACS)
Industrial Safety
https://pubs.acs.org/doi/full/10.1021/cen-10139-polcon2
BY: **Jeff Johnson, special to C&EN**; *C&EN*, **2023**, 101 (39), p 11 November 27, 2023

Report Finds Hundreds of Accidents

Chemical industry challenges findings, which advocates say argue for new safety regulations

A new report by a coalition of community and health organizations has identified 825 hazardous chemical incidents in the US since January 2021.

The number of incidents tallied by the group is far higher than the number previously identified by government bodies responsible for collecting accident information and regulating companies. A plurality of the incidents, 344, occurred in the plastics and petrochemical sectors, the group says.

The study was led by Coming Clean, an environmental health organization. The review tabulated media and other reports of hazardous chemical incidents, including leaks, spills, and releases of toxic or flammable chemicals. It found that 43 people were killed in these incidents. More than 150 resulted in injury, hospitalization, or reports of acute symptoms.

The groups are using the report to push the Environmental Protection Agency to reauthorize and toughen its risk management program (RMP). The 30-year-old program is intended to protect communities near facilities that handle large amounts of hazardous chemicals. The program affects some 12,500 facilities and more than 100 million people living near the plants, according to the EPA.

A new, tougher regulation was proposed in August 2022, and the EPA began a series of public meetings. A similar…

ARTICLE, SEE December 2023

Chemical Engineering Progress (CEP) Magazine, American Institute of Chemical Engineers (AIChE)
Spotlight on Safety
https://www.aiche.org/resources/publications/cep/2023/december/spotlight-on-safety-looking-ahead-first-ever-international-process-safety-week

BY: **EVAN PFAB**, *CEP*, December **2023**, p 22

Spotlight on Safety: Looking Ahead at the First Ever International Process Safety Week

International Process Safety Week (IPSW) will take place Dec. 2–6, 2024. This virtual event is a joint effort between the Center for Chemical Process Safety (CCPS), IChemE Safety Centre (IChemESC), Mary Kay O'Connor Process Safety Center (MKOPSC), Fire and Blast Information Group (FABIG), and the European Process Safety Centre (EPSC). IPSW will, in part, commemorate the 40th anniversary of the Bhopal tragedy, considered the world's worst industrial disaster.

CEP sat down with Shakeel Kadri, Executive Director and CEO of CCPS, to hear more about this inaugural event.

International Process Safety Week in December 2024 will be the first of its kind. Where did the idea come from?

Kadri: Frankly, the process safety community has talked about the idea of having such a day or week for many years. The community always felt that such an event would improve awareness of process safety. However, no serious effort was put forward by the community in the past. Having said that, I'm aware of many companies who have put forward a process safety day or a process safety week in their own company. And that would be either to commemorate one of their own significant incidents or an incident from industry. The objective is really to raise a constant awareness of process safety…

ARTICLE, SEE December 2023

Chemical Engineering Progress (CEP) Magazine, American Institute of Chemical Engineers (AIChE)
Plant Operations
https://www.aiche.org/resources/publications/cep/2023/december/cybersecurity-risk-assessment-strategies-industrial-control-systems
BY **TIM GALE**, *CEP*, December **2023**, p 35

Cybersecurity Risk Assessment Strategies in Industrial Control Systems

Managing cybersecurity risk in an industrial control system requires a risk assessment approach that addresses the unique nature of the technologies and consequences involved.

Risk assessment strategies in industrial control systems (ICSs) are an essential part of identifying undesirable and potentially deadly consequences. These strategies typically involve evaluating the severity of scenarios and existing security measures and prioritizing recommended additional safeguards. Robust and ongoing risk assessments help industrial facilities prioritize their resources and budgets to provide the appropriate level of risk mitigation. All stakeholders in the ICS, from management and engineering through operations, will benefit from an understanding of the possible risks to their systems and how to mitigate them. This article discusses risk assessment strategies to better secure the ICS from cyber threats.

The ICS is typically composed of field sensors, industrial controllers, computers, and final control elements. Field sensors read process conditions — such as pressure, level, temperature, or flow — and communicate this information to the controller. The controller uses the process conditions, along with specific algorithms, to determine appropriate actions to take to maintain control over the process. The actions required are carried out by final elements, which may include control valves that modulate the flow of liquids or discrete controls used to turn equipment on or off…

ARTICLE, SEE November 20, 2023 ISSUE
Science Concentrates: Infectious Disease,
https://pubs.acs.org/doi/10.1021/cen-10138-scicon1
BY: **Alla Katsnelson, special to C&EN**, *C&EN*, **2023**, 101 (38), p 5November 20, 2023

COVID Moonshot yields coronavirus antivirals

Open-source initiative may offer a path to pandemic preparedness

A novel drug candidate for COVID-19 that targets SARS-CoV-2's main protease (Mpro) is one of several potential antiviral drugs to be identified through an open-source science project called the COVID Moonshot Consortium (Science 2023, DOI: 10.1126/science.abo7201). The consortium , which began as a grassroots volunteer effort but is now funded by the US National Institutes of Health (NIH), will continue developing antiviral drugs for severe acute respiratory syndrome (SARS) and other viruses of pandemic concern. The success of the consortium, to which 212 scientists from 47 organizations across 25 countries contributed, demonstrates the power of open-source drug discovery for urgent public health problems, the researchers say. The effort began with a dataset of combined crystallographic and electrophilic fragment screens of SARS-CoV-2's Mpro generated by structural biologists Frank von Delft and Martin Walsh at Diamond Light Source, the UK's national synchrotron science facility, and chemical biologist Nir London at the Weizmann Institute of Science. In March 2020, the researchers tweeted an open invitation to scientists worldwide to design potential compounds based on the fragment hits, promising to make and test those that looked feasible.

"It kind of snowballed from there," says Annette von Delft, a translational scientist at the University of Oxford. (The von Delfts are married.)…

ARTICLE, SEE November, 2023 ISSUE

The Future of Bioengineering: Chemical Engineering Progress (CEP) AIChE monthly magazine,
https://www.aiche.org/resources/publications/cep/2023/november/bright-future-bioengineering
BY: **EMILY PETRUZZELLI, MELANIE MESROPIAN**, *CEP*, **2023**, pp 22, November, 2023

A Bright Future for Bioengineering

Bioengineering is a vast, multidisciplinary field that involves the application of engineering principles and tools to biological systems. Overall, it is focused on improving human health, wellbeing, and quality of life. Bioengineering can involve disease prevention and treatment — including the development of medical technologies — as well as manipulating organisms all the way down to the molecular level for chemical, food, and fuel production, among many other innovations. As such, this special section is dedicated to the exciting future of bioengineering…

The Future of Bioengineering: Chemical Engineering Progress (CEP) AIChE monthly magazine,
https://www.aiche.org/resources/publications/cep/2023/november/reimagining-dna-code-more-life
BY: **MAGDELENE N. LEE, JAMES M. TUCK, ALBERT J. KEUNG**, *CEP*, **2023**, pp 34, November, 2023

Reimagining DNA as the Code of (More Than) Life

Advances in DNA sequencing, DNA synthesis, and molecular biology techniques have already created DNA-based information systems rivaling the capabilities of early mechanical and electronic computers.

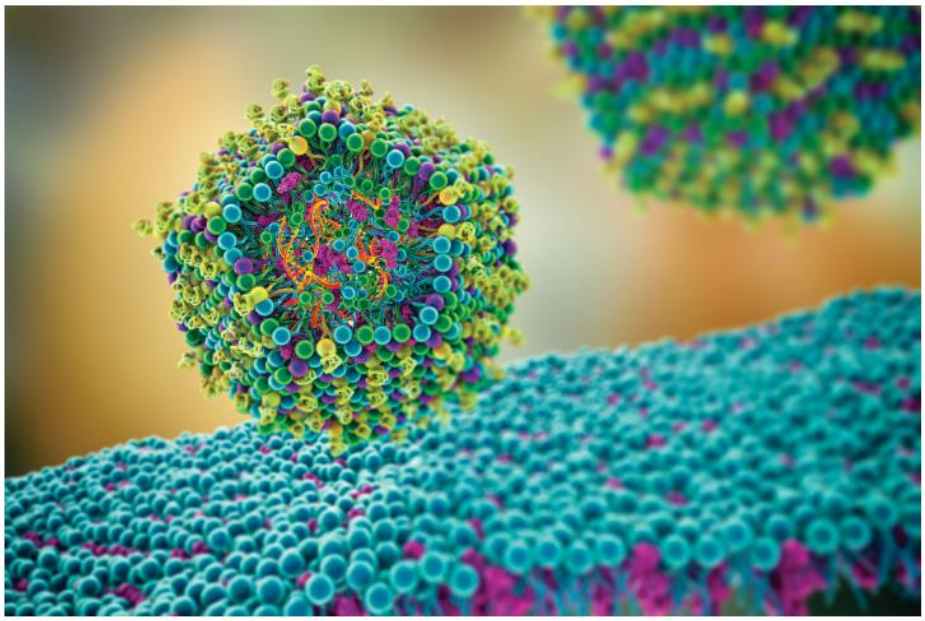
DNA is often referred to as the code of life. That code has largely remained a biological one that is decoded in many ways, for example, into RNA transcripts, codons, and proteins. A growing body of work paints an exciting potential future where DNA could be the code not only of life, but of broader human society and civilization, capturing and processing digital information or driving molecular circuits and machines to execute useful functions beyond the confines of life as we know it.

DNA is a promising medium for digital data due to its information density, long-term stability, and energy efficiency. Its potential to store and compute information was first posited decades ago but was relegated to the sidelines in favor of the rapid growth in capabilities of electronic media *(1, 2)*. Now, transformative leaps in capabilities are needed as storage and computational demands are outpacing traditional technologies, and DNA has the potential to meet these needs. Major challenges that face DNA-based systems include high DNA synthesis and sequence costs, long latencies in unit operations, and questions surrounding limits to the functionalities and scalability of such systems. Excitingly, recent advances in synthesis and sequencing technologies and a continually improving breadth and depth of molecular biology and biochemical techniques have driven a resurgence in research and development activity. Therefore, DNA has great potential to positively impact human society as the “code of (more than) life.”
This article reviews DNA-based information systems and discusses how these systems are analogous to electronic computers. The article also explores recent work capturing unique functionalities that have no clear analogies to our current conception of computers…

ARTICLE, SEE December 4, 2023 ISSUE
Year in Pharma: Vaccines, Chemical & Engineering News (C&EN) weekly magazine,
https://pubs.acs.org/doi/10.1021/cen-10140-cover6
BY: **Laurel Oldach**, *C&EN*, **2023**, 101 (40), pp 32–33December 4, 2023

In a Nobel year, mRNA vaccines progressed toward new targets

Clinical trials in infectious diseases, cancer, and rare diseases pressed onward; investors hung back



Messenger RNA vaccines are usually delivered in lipid nanoparticles like this one. (Credit: Science Source)

The impact of messenger RNA (mRNA) as medicine hardly needs to be stated. Billions of people worldwide have received at least one mRNA vaccine for COVID-19. This year, the research that enabled this global immunization was recognized with a Nobel Prize, while the candidate vaccines and therapeutics that companies hope will become the next generation of mRNA medicines advanced through large clinical trials. Despite these successes, research investment has slowed compared with the frenzy of recent years.

In a highly anticipated Nobel nod, Katalin Karikó of the University of Szeged and Drew Weissman of the University of Pennsylvania received the Nobel Prize in Physiology or Medicine in October for discovering a way to slip RNA past a cell's defenses so that it can be translated into protein.

"The whole world has now seen . . . that RNA therapeutics could allow for making fast, potent, flexible vaccines that can generate very strong immune responses," says Vinod Balachandran, a physician-scientist at Memorial Sloan Kettering Cancer Center who is testing mRNA vaccines for pancreatic cancer.

The use of RNA for medicine is not new; a number of therapies use short RNA molecules to block protein production. But for now, COVID-19 vaccines are the only products approved by the US Food and Drug Administration that use mRNA, which encodes proteins, to produce new proteins in cells. Multiple mRNA drug candidates are advancing through clinical trials…

ARTICLE, SEE December 4, 2023 ISSUE
Year in Pharma: Pharmaceuticals, Chemical & Engineering News (C&EN) weekly magazine,
https://pubs.acs.org/doi/10.1021/cen-10140-cover7
BY: **Laura Howes**, *C&EN*, **2023**, 101 (40), pp 34–35December 4, 2023

Memorable moments

These are the moments, numbers, and news that the C&EN team found noteworthy this year

"As a malaria researcher, I used to dream of the day we would have a safe and effective vaccine against malaria. Now we have two."
—Tedros Adhanom Ghebreyesus, director general, World Health Organization, in a news release
In October, about 2 years after recommending the first malaria vaccine, the World Health Organization endorsed a second one to protect children against the deadly disease. The R21/Matrix-M vaccine was developed by the University of Oxford and is manufactured by the Serum Institute of India…

Open-source drug discovery prepared for the next pandemic

New antiviral drug leads were reported by an open-source drug discovery effort, the COVID Moonshot Consortium (*Science* 2023, DOI: 10.1126/science.abo7201). Since March 2020, 212 scientists across 25 countries have contributed to the project. The team's lead compound is now being advanced by the Drugs for Neglected Diseases initiative, while the consortium will continue developing antiviral drugs for viruses of pandemic concern.

"As NIH director, I look forward to ensuring that NIH continues to be the steward of our nation's medical research while engaging all people and communities in the research effort that includes informing medical practice that drives equitable access to health care for all."

—Monica Bertagnolli, director, National Institutes of Health, in a news release…

ARTICLE, SEE May-June, 2022, Volume 42, Number 3 ISSUE

Special Report: Pharmaceutical Engineering, International Society for Pharmaceutical Engineers (ISPE), https://ispe.org/pharmaceutical-engineering/may-june-2022/special-report-pandemic-progress-industrys-journey-2020

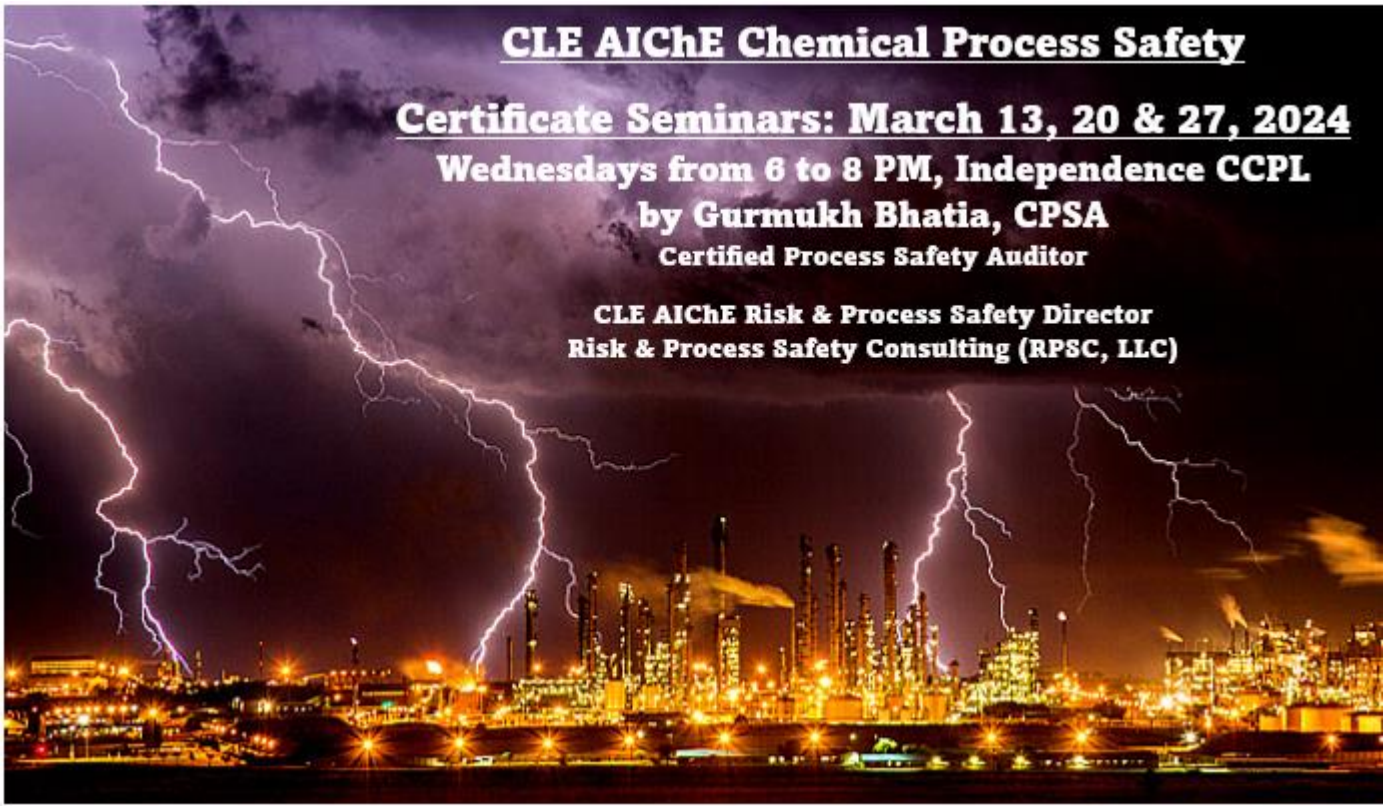
BY: **Wendy T. Haines, PhD, DABT, CQA,** *PE Magazine*, **2022**, 101 (26), pp 44-47 , May-June 2022

Special Report: Pandemic Progress: Industry's Journey From 2020 to Today

In 2020, the world was grappling with how to slow the spread of the SARS-CoV-2 virus and appropriately treat people who had the COVID-19 infection without approved therapies or vaccines. In two years, there are multiple vaccines and treatments along with great knowledge about the virus—and about how the industry mobilized, partnered, and achieved tremendous strides in addressing the global pandemic…

THE FIRST VACCINES

The mRNA (messenger ribonucleic acid) vaccines received conditional approval and then gained full approval by the FDA. mRNA are single-stranded molecules that instruct human bodies to make proteins. mRNA vaccines contain three main types of ingredients: mRNA, lipids, and salts and sugars.13 The mRNA used in both the Comirnaty (BNT162b2) vaccine manufactured by Pfizer, Inc. and BioNtech and the Spikevax (mRNA-1273) vaccine manufactured by ModernaTX, Inc., is a modified nucleoside mRNA encoding the S protein of SARS-CoV-2. This instructs the body to assemble a harmless piece of protein from the virus that causes COVID-19.13 The protein that is produced activates the immune system to recognize COVID-19 infection in the future. In general, the lipids (fat) work in concert to enable mRNA entry into cells and the salts and sugars help ensure vaccine stability while the vaccine is manufactured, frozen, shipped, and stored until administered…



CLE AIChE: Cleveland Chapter

Fall 2023 – Spring 2024 Program Planning

(as of Jan2024)

Month	Topic, Speaker	Location	AIChE Officer Responsible
September 8, 2023 (Friday 6 PM)	Oktoberfest Social Event	German Central Farm, Parma	Joe Yurko, $7/guest admission + $ food & beverage? https://germancentralfoundation.com/oktoberfest
October 11, 2023 (Wednesday 6 PM)	Brewery Tasting Tour	Market Garden Brewery, OH City	Mike Galgoczy, $20/guest with 20 guests. Dinner: 7 PM Market Garden Brewpub & Restaurant.
October 30, 2023 (Wednesday 5:30PM)	ASM Joint Meeting: Heat Treater's Night H2 effect on heating metals, Justin Dzik, PE	FIVES North American Combustion, Inc., Talk & Tour	Joe Spagnuolo & Joe Yurko: $30 Non-members, $15 Retirees, $5 Students. https://www.fivesgroup.com/energy-combustion
November 14, 2023 (Tuesday 6 PM)	History of ACS 7-National Chemical Landmarks Sites in Cleveland, Helen Mayer Speaking	The Sanctuary, Rockside Road Independence, 44131	Joe Yurko, Dinner menu ordering for professional members, Students cost: $5 http://places.singleplatform.com/shulas-steak-house-8/menu#menu_5599999
December 7, 2023 (Thursday 6 PM)	Nuclear Power an Introduction, Speaking: Andrew Ohrablo	The Sanctuary, Rockside Road Independence, 44131	Joe Yurko, Dinner menu ordering for professional members, Students cost: $5 http://places.singleplatform.com/shulas-steak-house-8/menu#menu_5599999
January 29, 2024 (Monday 6 PM)	Chemical Process Safety Analysis, Speaking: Gurmukh Bhatia, CPSA	CCPL Independence 6361 Selig Drive Independence, 44131	Joe Yurko, Dinner for professional member's cost: $10, Students cost: $5 CCPL Independence Branch: 216-447-0160, Menu: vote on recipe
February 15, 2024 (Thursday 6 PM)	Appalachian Regional Clean H2 Hub ARCH2 DOE Award, Andrew Thomas, JD, CSU	The Sanctuary, Rockside Road Independence, 44131	Joe Yurko, Dinner menu ordering for professional members, Students cost: $5 http://places.singleplatform.com/shulas-steak-house-8/menu#menu_5599999
March, 2024	Safety Engineering in Oil Refining processes; Marianne Corrao Speaking	The Sanctuary, Rockside Road Independence, 44131	Mike Galgoczy, Dinner menu ordering for professional members, Students cost: $5 http://places.singleplatform.com/shulas-steak-house-8/menu#menu_5599999
March 13, 20 & 27 Wednesday 6-8 pm	Chemical Process Safety Analysis Seminars; Gurmukh Bhatia, CPSA	CCPL Independence 6361 Selig Drive Independence, 44131	Joe Yurko, Dinner cost is included in the seminar expense. Seminar expense: TBA at a later time. Certificates will be awarded for each class as well as a final certificate.
April, 2024	NEOSEF Awards Banquet Quantum Computer, Dr. Yu ?	CSU Washkewicz Hall, Rm 349	Joe Spagnuolo, Moderator NEOSEF Students, Prof. Nolan Holland, CSU ChE Lab Tours, $15 members, Students Free
May	Cleveland Cliffs Steel Mill Tour, TBA	CCPL Independence 6361 Selig Drive Independence, 44131	Bruno Mancini. Joe Yurko, Dinner for professional member's cost: $10, Students cost: $5 CCPL Independence Branch: 216-447-0160, Menu: vote on recipe.